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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,621	12/14/2005	Hiromune Matsuoka	DK-US030324	5596
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EXAMINER				
COX, ALEXIS K				
ART UNIT		PAPER NUMBER		
4116				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/560,621

Applicant(s)

MATSUOKA ET AL.

Examiner

ALEXIS K. COX

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/88)
- Paper No(s)/Mail Date 1/23/2007, 12/14/2005
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claim 5 is objected to because of the following informalities: the limitation "by releasing a sealed gas inside the refrigerant connecting pipe into the atmosphere" states a release of gas both into the pipe and into the atmosphere. The examiner suggests insertion of the word "from", to create the limitation "releasing a sealed gas from inside the refrigerant connecting pipe." Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 6-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3. Regarding claim 6, the limitation "the separation membrane being configured to separate from a refrigerant and discharge out of the liquid side refrigerant circuit a noncondensable gas... by operating a compressor" indicates the separation membrane to be operating the compressor. This is not the manner in which the membrane

operates according to the specification. The examiner suggests a revision stating the gas separation apparatus discharges the noncondensable gas by operating the compressor. The examiner further suggests the applicant revise the claim to indicate the gas separation apparatus to discharge the noncondensable gas, rather than the gas separation membrane to discharge the apparatus.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Regarding claim 6, the limitation "configured to connect a heat source side heat exchanger" is unclear as to whether the separation membrane or the gas separation apparatus is configured. The examiner's interpretation for the purpose of examination in view of the specification is that the gas separation apparatus is what is configured.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-13 are rejected under 35 U.S.C. 102 (b) as being anticipated by Spauschus (US Patent No. 4,417,451).

9. Regarding claims 6-8, figure 1 of Spauschus teaches a vapor compression refrigerant system with gas removal apparatus including a gas separation apparatus (17, 21, 24, 20, 22, 23, see column 4 lines 30-44, see also figures 2-4) including a membrane (24, see column 4 line 37) connected to a liquid side refrigerant circuit (15, 13, 14, 17, and connecting pipes, see column 4 lines 14-17), the liquid side refrigerant circuit being configured to connect to the heat exchanger (13, see column 4 line 13) of the heat source side unit (11, 12, 13, 17, 14, see column 4 lines 11-21) and the utilization side heat exchanger (15, see column 4 lines 13-14), the separation membrane being configured to separate from a refrigerant and discharge out of the liquid side refrigerant circuit a noncondensable gas remaining inside a refrigerant connecting pipe (20, see column 4 lines 35-36), the separation membrane's function being enhanced by the operation of a compressor circulating the refrigerant inside the liquid side refrigerant circuit. Figure 1 of Spauschus further teaches the refrigeration apparatus to include a receiver (17, see column 4 line 16) in the liquid side refrigerant circuit, the receiver being configured to accumulate the refrigerant flowing between the heat source side heat exchanger and the utilization side heat exchanger, the gas separation apparatus being connected to the receiver and configured to separate the noncondensable gas contained in a gas phase of the refrigerant accumulated in an upper part of the receiver. Additionally, figure 1 of Spauschus teaches the gas separation apparatus to include a discharge valve (22, see column 6 line 67) configured to release the noncondensable gas into the atmosphere after separation.

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10. Regarding claims 1-5 and 9-13, all structural requirements of the method taught have been met by Spauschus as shown above.

Double Patenting

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claims 1-7, 9 and 11-13 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 14 and 20 of U.S. Patent No. 7,357,002 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other.

13. In regard to claims 1 and 2, said claims recite "forming a refrigerant circuit by connecting a heat source unit and a utilization unit to a refrigerant connecting pipe" (see lines 3-6 of claim 1 of the patent), "discharging a noncondensable gas by operating a compressor of the heat source unit to circulate a refrigerant inside the refrigerant circuit, (see lines 7-11 of claim 1 of the patent), by using a membrane to separate the noncondensable gas remaining inside the refrigerant connecting pipe from the refrigerant flowing between a heat source side heat exchanger of the heat source unit and a utilization side heat exchanger of the utilization unit, and by discharging the noncondensable gas out of the refrigerant circuit" (see lines 12-22 of claim 1 of the patent), "installing the heat source unit, the heat source side heat exchanger and the utilization unit prior to the forming of the refrigerant circuit." (See lines 3-6 of claim 1 of the patent). It is clear that all the elements of claims 1 and 2 of the present application are to be found in claim 1 of the patent. Hence, since claims 1 and 2 of the application are anticipated by claim 1 of the patent, they are not patentably distinct. See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

14. In regard to claims 3 and 9, said claims recite "the refrigerant flowing between the heat source side heat exchanger and the utilization side heat exchanger is a vapor-liquid separated gas refrigerant that is separated into a liquid refrigerant and a gas refrigerant containing the noncondensable gas" (see lines 3-7 of claim 2 of the patent) and "the noncondensable gas is separated from the vapor-liquid separated gas refrigerant" (see lines 18-20 of claim 1 of the patent). It is clear that all the elements of

claims 3 and 9 of the application are to be found in claim 2 of the patent (as it encompasses claim 1). Hence, since claims 3 and 9 of the application are anticipated by claim 2 of the patent, they are not patentably distinct. See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

15. In regard to claims 4, 5, 12, and 13, said claims recite "the noncondensable gas is released into an atmosphere" (see lines 5-7 of claim 20 of the patent), "performing a seal test step on the refrigerant connecting pipe before discharging the noncondensable gas" (see lines 2-4 of claim 20 of the patent), and "reducing a pressure by releasing a sealed gas inside the refrigerant connecting pipe into the atmosphere after performing the seal test" (see lines 5-7 of claim 20 of the patent). It is clear that all the elements of claims 4, 5, 12, and 13 of the application are to be found in claim 20 of the patent (as it encompasses claims 1 and 2). Hence, since claims 4, 5, 12, and 13 of the application are anticipated by claim 20 of the patent, they are not patentably distinct. See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

16. In regard to claims 5 and 11, said claims recite "performing a seal test on the refrigerant connecting pipe before discharging the noncondensable gas" (see lines 2-4 of claim 3 of the patent) and "reducing a pressure by releasing a sealed gas inside the refrigerant connecting pipe into the atmosphere after performing the seal test" (see lines 5-7 of claim 3 of the patent). It is clear that all the elements of claims 5 and 11 of the application are to be found in claim 3 of the patent (as it encompasses claim 1). Hence,

since claims 5 and 11 of the application are anticipated by claim 3 of the patent, they are not patentably distinct. See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

17. In regard to claim 6, said claim recites "a gas separation apparatus including a separation membrane connected to a liquid side refrigerant circuit configured to connect a heat source side heat exchanger and a utilization side heat exchanger," (see lines 6-9 and 15-22 of claim 4 of the patent), "the separation membrane being configured to separate from a refrigerant and discharge out of the liquid side refrigerant circuit a noncondensable gas remaining inside a refrigerant connecting pipe" (see lines 19-25 of claim 4 of the patent), "by operating a compressor and circulating the refrigerant inside the liquid side refrigerant circuit" (see lines 7-11 of claim 1 of the patent). It is clear that all the elements of claim 6 of the application are to be found in claim 4 of the patent. Hence, since claim 6 of the application is anticipated by claim 4 of the patent, they are not patentably distinct. See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

18. In regard to claim 7, said claim recites "the liquid side refrigerant circuit includes a receiver configured to accumulate the refrigerant flowing between the heat source side heat exchanger and the utilization side heat exchanger" (see lines 2-5 of claim 5 of the patent), "the gas separation apparatus is connected to the receiver, and is configured to separate the noncondensable gas contained in a gas phase of the refrigerant that is accumulated in an upper part of the receiver" (see lines 2-4 of claim 14 of the patent). It is clear that all the elements of claim 7 of the application are to be

found in claim 14 of the patent (as it encompasses claims 13, 5, and 4). Hence, since claim 7 of the application is anticipated by claim 14 of the patent, they are not patentably distinct. See *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee et al (US Patent No. 5,062,273) teaches a method and apparatus for removal of gas from refrigeration system including a membrane separator. Callahan et al (US Patent No. 6,128,916) similarly teaches use of a membrane to remove non-condensable gases from refrigeration systems. .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Friday 7:30a.m. to 5:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joe H. Cheng can be reached on 703-272-4433. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AKC/

/Sam Chuan C. Yao/
Supervisory Patent Examiner, Art Unit 4111